

**Lewis University**  
**STEM Undergraduate Research Experience**  
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**Faculty Mentor - Project Application**

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Predictive Modeling and Analysis of Sports Using Linear Algebra-based Models

**Abstract**

Ranking sports teams and predicting post-season results from seasonal games can be challenging. Among the many mathematically inspired sports ranking systems, the Colley and Massey methods are relatively simple and can easily be introduced to undergraduate students who have taken a linear algebra course. At their most basic level, these methods are useful for sports rankings, but unfortunately, they are not particularly strong at predicting future outcomes of games. One way to possibly improve these methods for ranking and predicting future outcomes is by introducing weights to these systems and by using cross validation to help determine the quality of our models. In this research, we will create and test the predictive power of weighted Colley Method and Massey Methods using either data from softball and golf teams in the Great Lakes Valley Conference or sports data of the students choosing.